

Claims

1.-6. (Canceled)

7. (Currently Amended) In a computer system comprising a computer, a method of annotating computer program code stored on a computer-readable medium, ~~wherein the computer program code is operable to cause a computer to perform according to instructions in the computer program code~~, the method comprising:

inserting, by the computer, one or more in-line code annotations at one or more annotation targets in source code;

wherein the one or more in-line code annotations comprise at least one annotation on a first pointer to a buffer, wherein the at least one annotation comprises a property that indicates a characteristic of the buffer, wherein the property that indicates the characteristic of the buffer takes a size argument, and wherein the size argument comprises a location of a second pointer associated with the buffer; and

wherein the ~~annotations~~ at least one annotation on the first pointer ~~are~~ is placed in an argument list to a function call that uses the first pointer as a parameter.

8.-13. (Canceled)

14. (Previously presented) The method of claim 7 wherein the characteristic is a readable extent of the buffer.

15. (Previously presented) The method of claim 7 wherein the characteristic is a writable extent of the buffer.

16.-20. (Canceled)

21. (Previously presented) The method of claim 7 wherein the at least one annotation includes an annotation prefix.

22.-23. (Canceled)

24. (Currently Amended) In a computer system comprising a computer, a method of annotating computer program code stored on a computer-readable medium, wherein the computer program code is operable to cause ~~a computer~~ computer execution to perform according to instructions in the computer program code, the method comprising:

inserting, by the computer, an annotation at a first value having a first value type in the computer program code;

wherein the annotation comprises a first instance of a keyword, the first instance of the keyword indicating that the first value satisfies all usability properties necessary to allow a first function to rely on the first value, wherein other instances of the keyword identical to the first instance are operable to indicate that other values having different

respective value types satisfy all usability properties necessary to allow functions to rely on the respective other values, wherein use of the keyword associates a pre-determined set of usability properties with a value type, and wherein the usability properties depend on the value type.

25. (Canceled)

26. (Canceled)

27. (Previously presented) The method of claim 24 wherein the first value type is scalar, void, pointer, user-defined type, or struct.

28. (Previously presented) The method of claim 24 wherein the first value is a reference parameter.

29. (Previously presented) The method of claim 24 wherein the first value is a pointer, wherein an object pointed to by the pointer has one or more readable elements, the one or more readable elements of the object each having usability properties sufficient to allow the first function to rely on the one or more readable elements.

30. (Currently Amended) In a computer system comprising a computer, a method of annotating computer program code stored on a computer-readable medium, ~~wherein the computer program code is operable to cause a computer to perform according to instructions in the computer program code~~, the method comprising:

inserting, by the computer, an annotation having an annotation argument comprising a second value type in the computer program code, wherein the annotation annotates a variable having a first value type;

wherein the annotation changes the first value type of the variable to the second value type of the annotation argument.

31. (Original) The method of claim 30 wherein the first value type is a legacy value type.

32. (Previously Presented) The method of claim 30 wherein the second value type has a null-termination characteristic.

33. (Canceled)

34. (Currently Amended) In a computer system comprising a computer, a method of annotating computer-executable program code stored on a computer-readable medium, the method comprising:

adding, by the computer, an annotation to a pointer in the computer-executable program code, wherein the annotation describes transferring buffer properties from a second pointer to the pointer; and

including a location parameter with the annotation, wherein the location parameter describes ~~the~~ a logical buffer pointed to by the pointer.

35.-40. (Canceled)

41. (Currently Amended) The method of claim 7 further comprising using the location of the second pointer associated with the buffer to determine ~~the~~ size of the buffer.

42. (Previously presented) The method of claim 7 wherein the second pointer associated with the buffer is an end pointer for the buffer.

43. (Previously presented) The method of claim 7 wherein the second pointer associated with the buffer is an internal pointer for the buffer.

44. (Previously presented) The method of claim 14 further comprising using the location of the second pointer associated with the buffer to determine the readable extent of the buffer.

45. (Previously presented) The method of claim 15 further comprising using the location of the second pointer associated with the buffer to determine the writable extent of the buffer.

46. (Previously presented) The method of claim 24 wherein the annotation further comprises an except qualifier.

47. (Canceled)

48. (Canceled)

49. (Canceled)

50. (Canceled)

51. (Canceled)

52. (Canceled)

53. (Canceled)

54. **(Canceled)**

55. **(Canceled)**

56. **(Currently Amended)** The method of claim 24 wherein if the ~~second~~ **first** value type is a pointer, the usability properties necessary to allow the first function to rely on the first value comprises the pointer pointing to a buffer with at least one readable element.

57. **(Previously presented)** The method of claim 24 wherein if the first value type is a scalar, the usability properties necessary to allow the first function to rely on the first value comprises the scalar being initialized.

58. **(Canceled)**

59. **(Canceled)**

60. **(Canceled)**

61. (Previously Presented) The method of claim 30 wherein the second value type must be a visible type at program point where the annotation is placed.

62. (New) One or more computer-readable storage media having encoded thereon computer-executable instructions for performing a method of annotating computer program source code, the method comprising:

inserting, by a computer, one or more in-line code annotations at one or more annotation targets in the computer program source code;

wherein the one or more in-line code annotations comprise at least one annotation on a first pointer to a buffer, wherein the at least one annotation comprises a property that indicates a characteristic of the buffer, wherein the property that indicates the characteristic of the buffer takes a size argument, and wherein the size argument comprises a location of a second pointer associated with the buffer; and

wherein the at least one annotation on the first pointer is placed in an argument list to a function call that uses the first pointer as a parameter.

63. (New) One or more computer-readable storage media having encoded thereon computer-executable instructions for performing a method of annotating computer program source code, the method comprising:

inserting, by a computer, an annotation at a first value having a first value type in the computer program source code;

wherein the annotation comprises a first instance of a keyword, the first instance of the keyword indicating that the first value satisfies all usability properties necessary to allow a first function to rely on the first value, wherein other instances of the keyword identical to the first instance are operable to indicate that other values having different respective value types satisfy all usability properties necessary to allow functions to rely on the respective other values, wherein use of the keyword associates a pre-determined set of usability properties with a value type, and wherein the usability properties depend on the value type.

64. (New) One or more computer-readable storage media having encoded thereon computer-executable instructions for performing a method of annotating computer program source code stored on a computer-readable medium, the method comprising:

inserting, by a computer, an annotation having an annotation argument comprising a second value type in the computer program source code, wherein the annotation annotates a variable having a first value type;

wherein the annotation changes the first value type of the variable to the second value type of the annotation argument.